

ROAD TO A GREENER ENERGY FUTURE

CO₂ STORAGE:

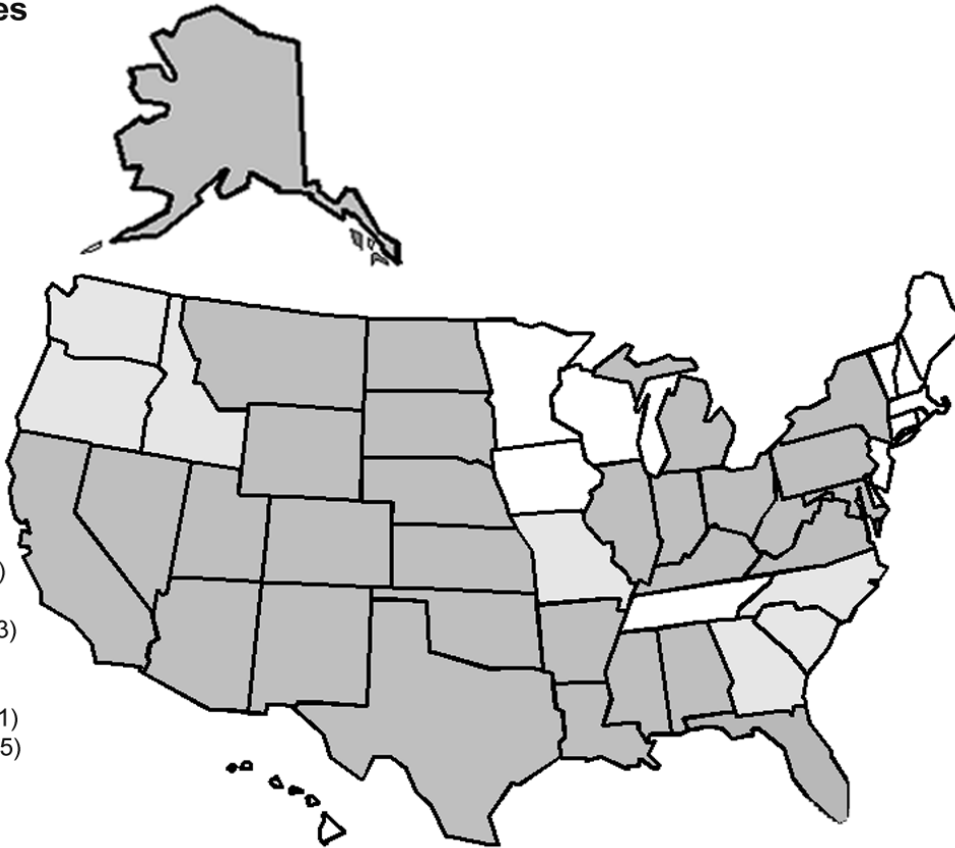
A LEGAL AND REGULATORY GUIDE FOR STATES



INTERSTATE OIL & GAS COMPACT COMMISSION

Member States

Alabama (1945)
Alaska (1957)
Arizona (1955)
Arkansas (1941)
California (1974)
Colorado (1935)
Florida (1945)
Illinois (1935)
Indiana (1947)
Kansas (1935)
Kentucky (1942)
Louisiana (1941)
Maryland (1959)
Michigan (1939)
Mississippi (1948)
Montana (1945)
Nebraska (1953)
Nevada (1955)
New Mexico (1935)
New York (1941)
North Dakota (1953)
Ohio (1943)
Oklahoma (1935)
Pennsylvania (1941)
South Dakota (1955)
Texas (1935)
Utah (1957)
Virginia (1982)
West Virginia (1945)
Wyoming (1955)



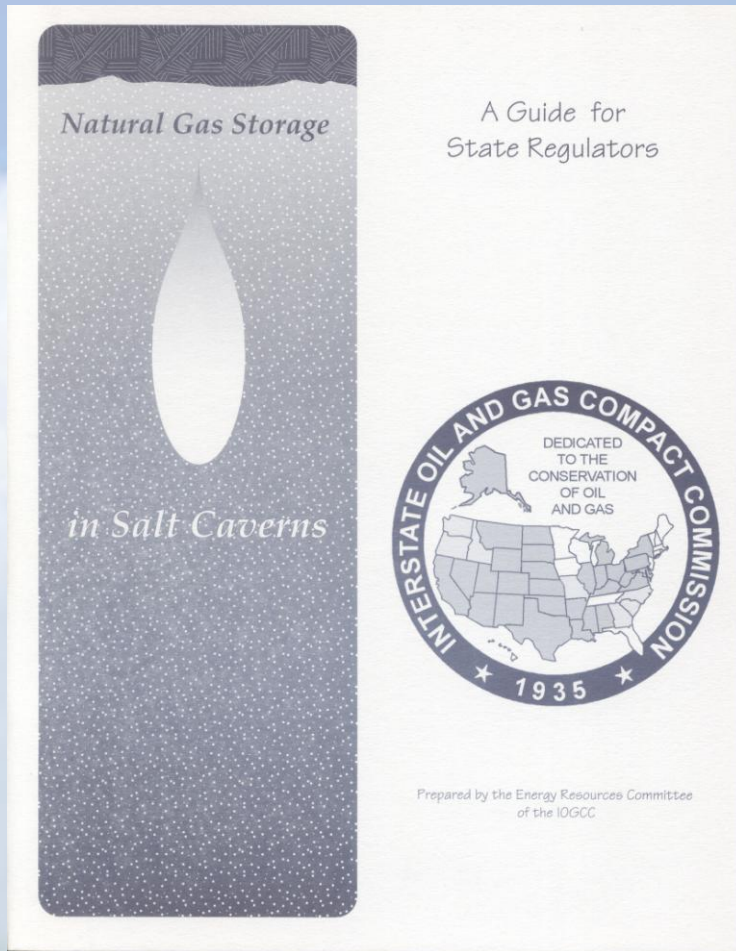
Associate States

Georgia (1946)
Idaho (1960)
Missouri (1995)
North Carolina (1971)
Oregon (1954)
South Carolina (1972)
Washington (1967)

International Affiliates

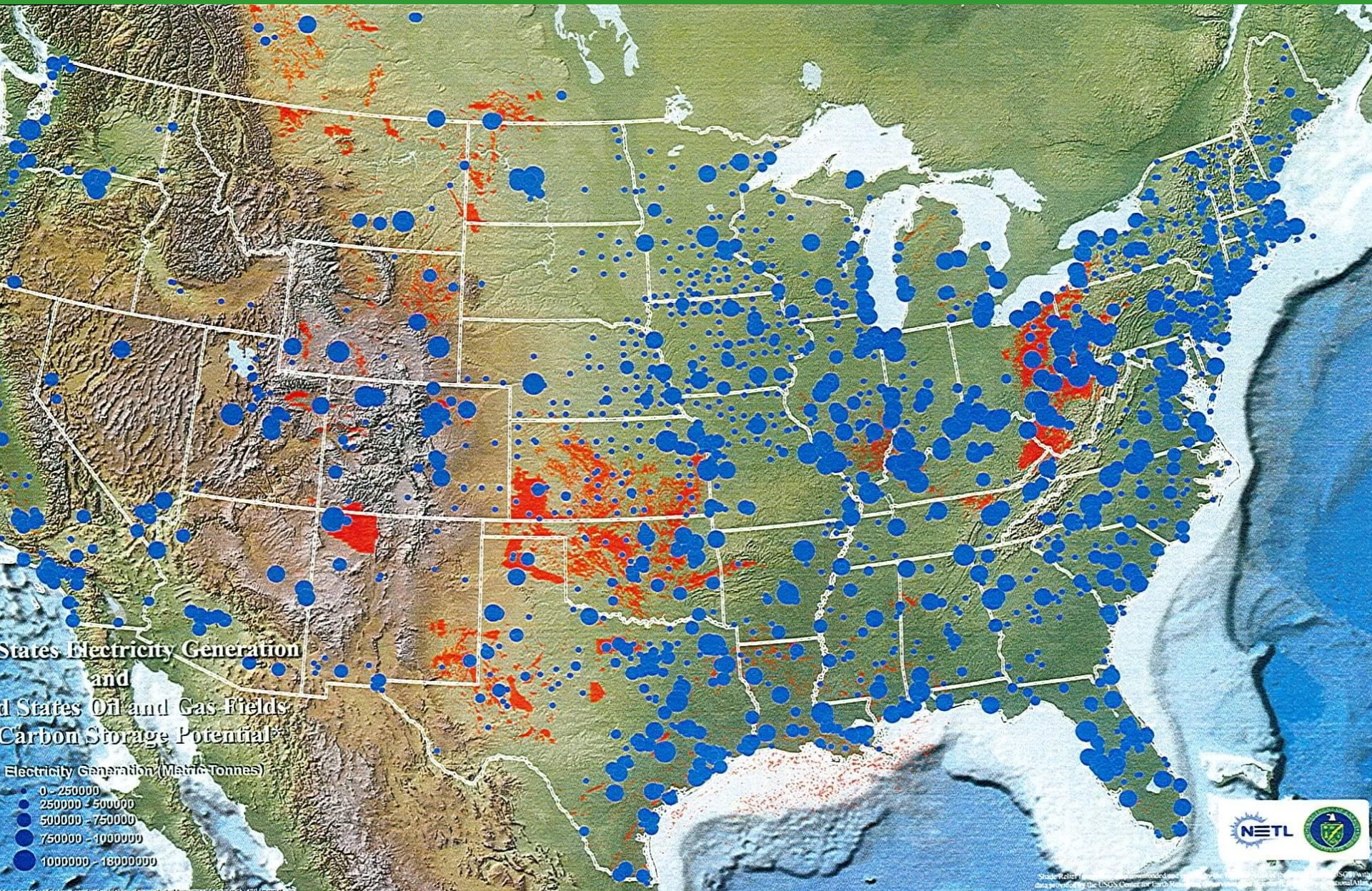
Alberta (1996)
British Columbia (2002)
Egypt (1999)
Republic of Georgia (2001)
Newfoundland and
Labrador (1997)
Nova Scotia (1997)
Venezuela (1997)

Model Regulatory Guidance

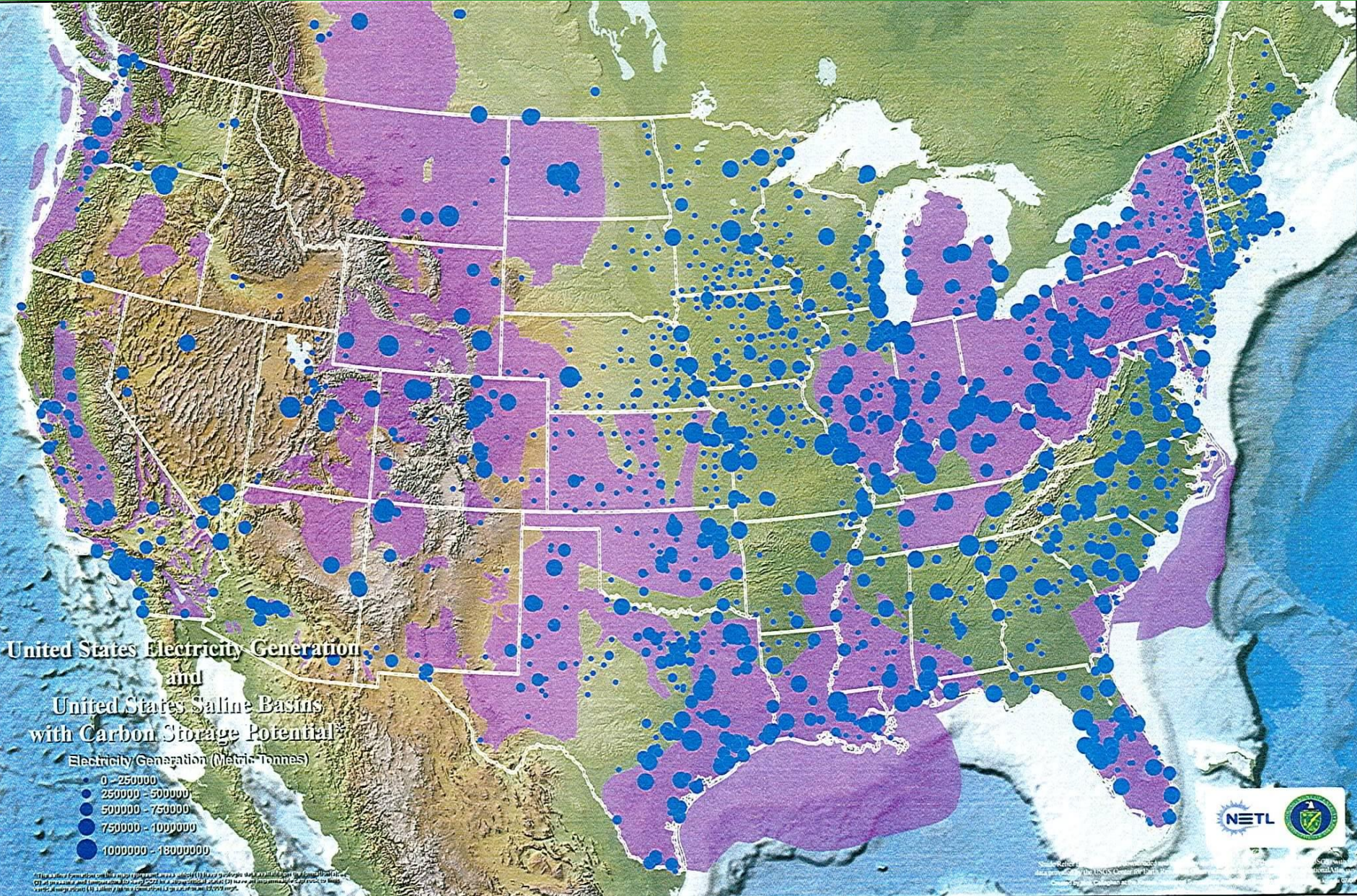


- One of many IOGCC regulatory guidance documents for states and provinces
- Helps ensure regulatory consistency among states and provinces.

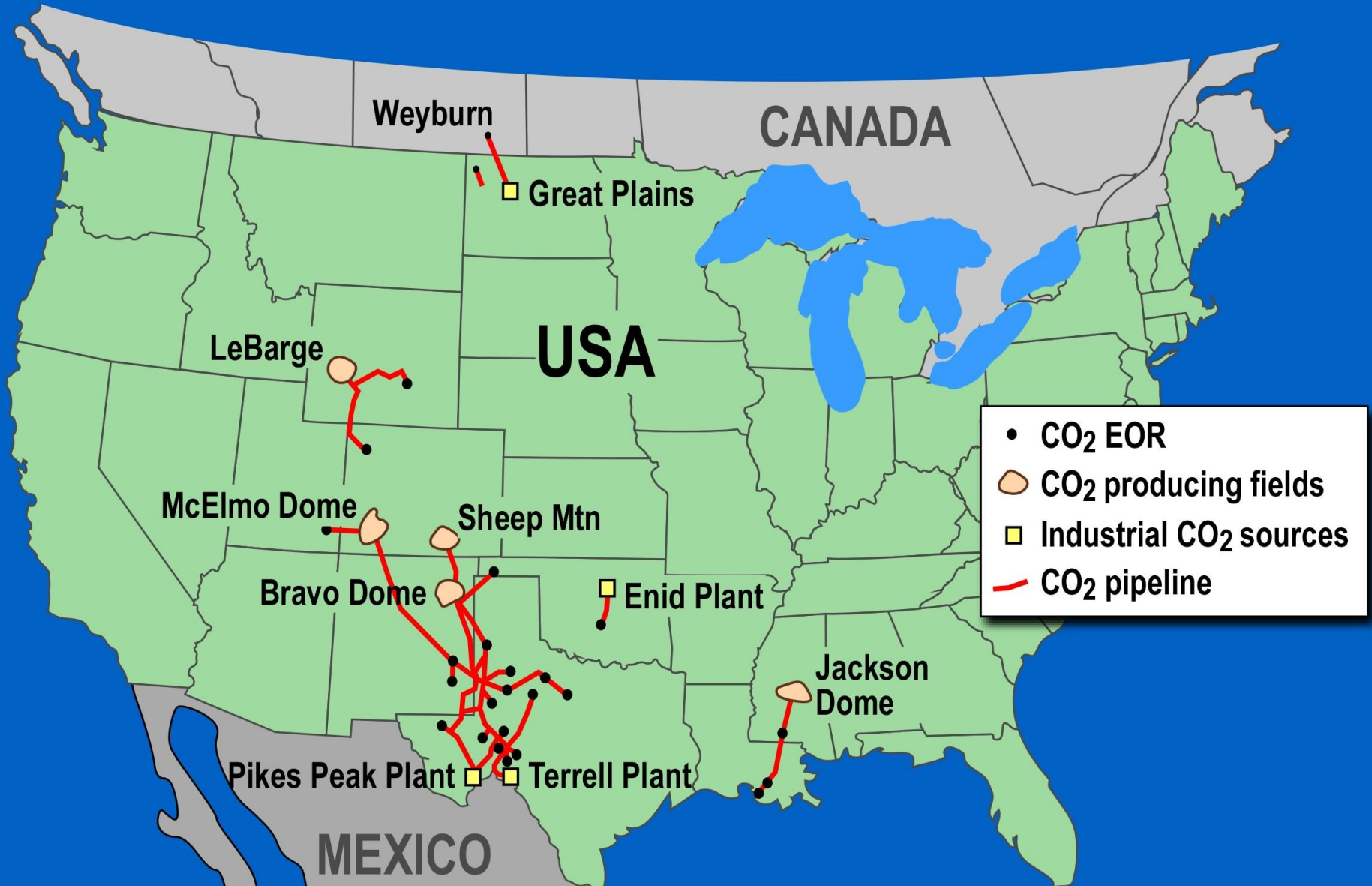
Oil and Gas Fields Storage Fairway and Electric Generation Plants



Saline Formation Storage Fairway and Electric Generation Plants



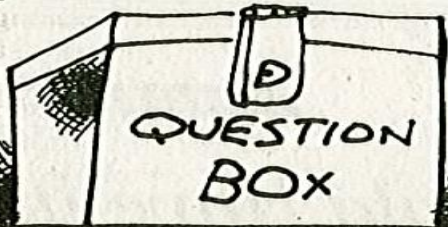
CO₂ Pipeline Network in the U.S. - Industry knows how to handle CO₂



7/16/07

THE WASHINGTON POST

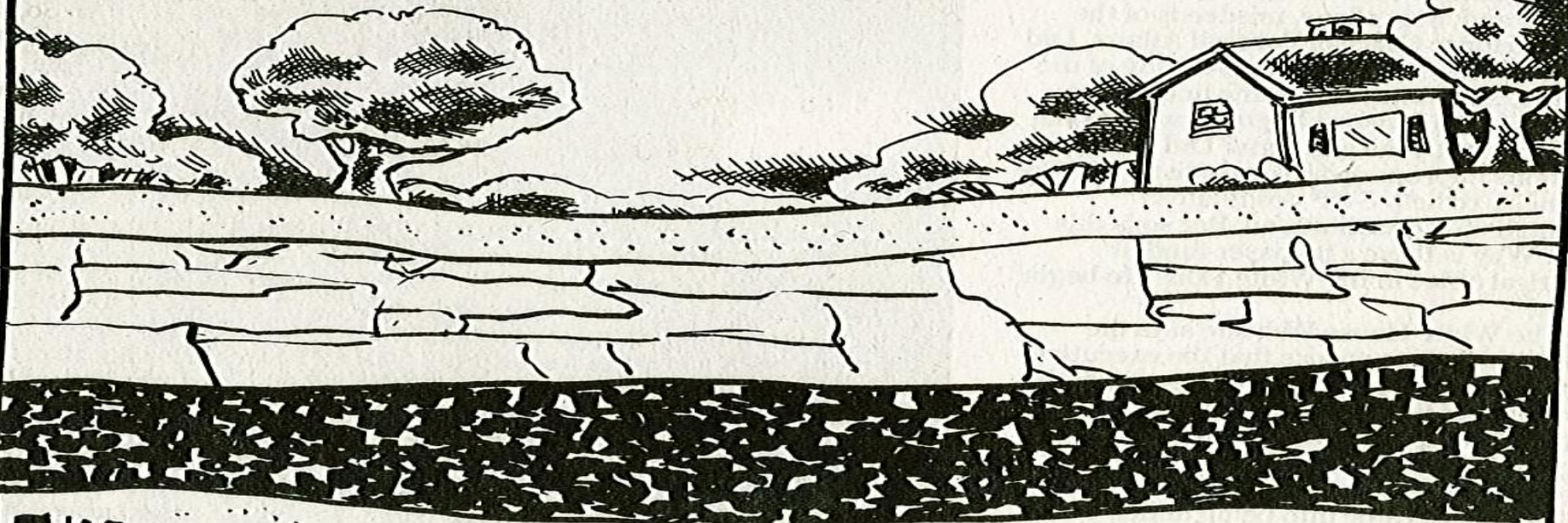
Tom Toles



QUESTION
BOX

Q: Is there any method of
carbon sequestration that
we actually know would work?

A: Leave the coal in the ground.



TOLES

©2007 THE WASHINGTON POST



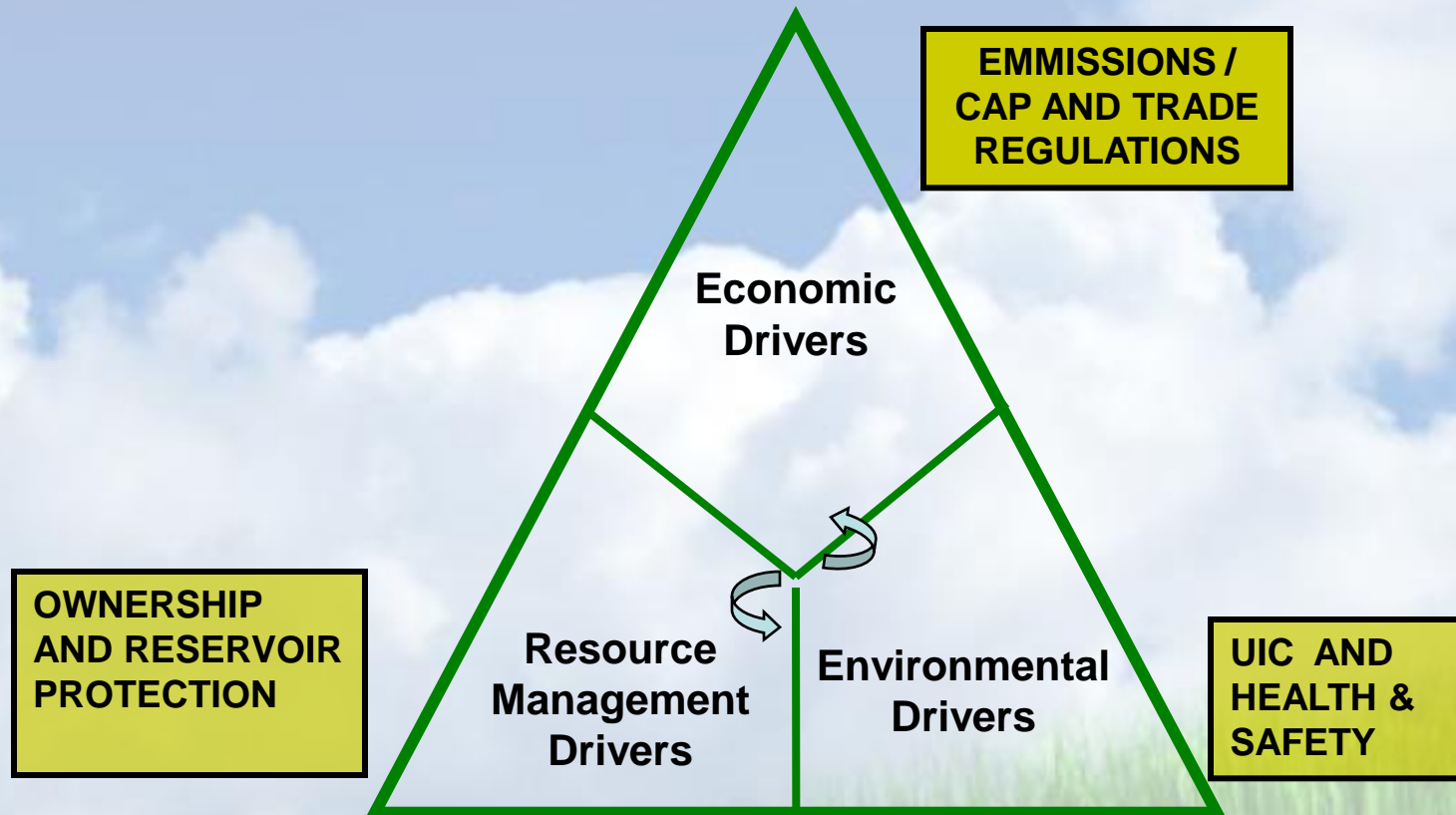
DIG UP
CHENEY'S
BUNKER.



New Paradigm Needed: IOGCC Resource Management Philosophy For CCS

- Given the regulatory complexities of CO₂ storage including environmental protection, ownership and management of the pore space, maximization of storage capacity and long term liability, the Task Force strongly believes that geologically stored CO₂ should be treated under a resource management framework as opposed to a waste disposal framework.
- Regulating the storage of CO₂ under a waste management framework sidesteps the public role in both the creation of CO₂ and the mitigation of its release into the atmosphere and places the burden solely on industry to rid itself of "waste" from which an "innocent" public must be "protected".
- Such an approach lacking citizen buy-in with respect to responsibility for the problem as well as the solution, could well doom geological storage to failure and diminish significantly the use of geologic carbon storage as a viable mitigation strategy for reducing CO₂ emissions.

CCS REGULATORY FRAMEWORKS



Legal, Regulatory and Liability Development Process

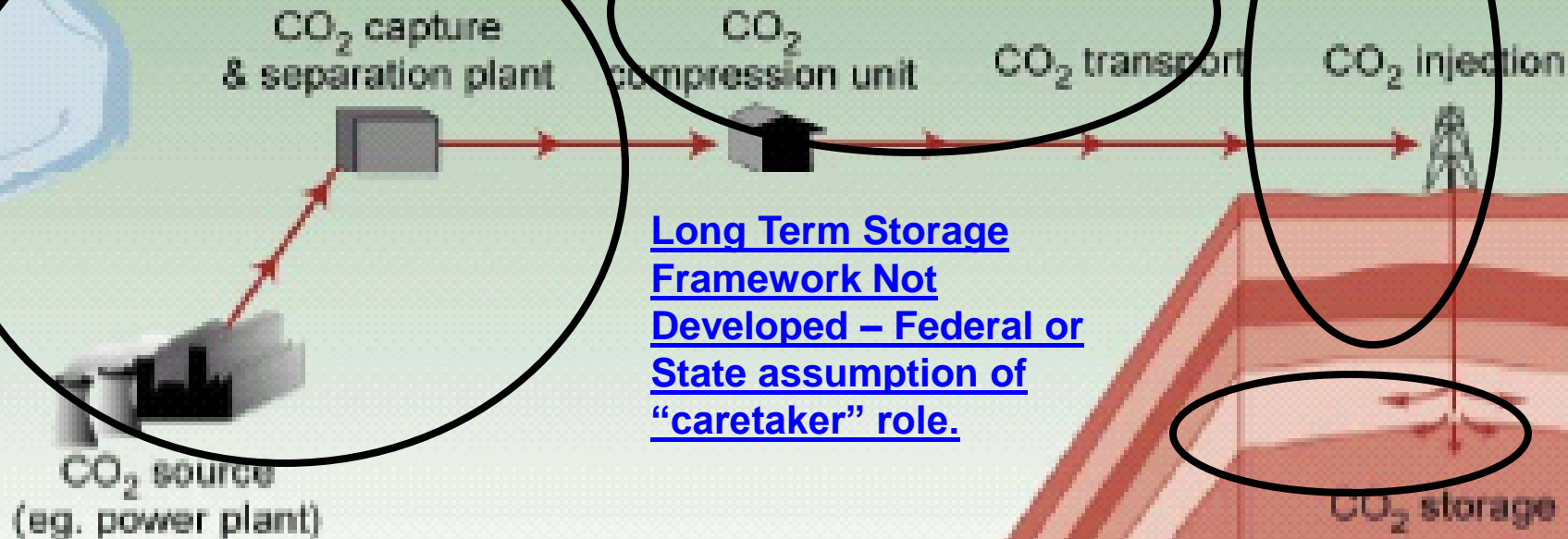
- **Policy**: What governments do to encourage or discourage a particular activity.
- **Legal**: Determine right to engage in a particular lawful activity on one's property.
- **Regulatory**: Grant permission to engage in that particular activity if certain conditions are being met.
- **Liability**: Establish who is responsible in case of failure.

CO2 CAPTURE TRANSPORTATION AND GEOLOGIC STORAGE PROCESS

Existing Regs
Administered by
State and
Federal
Environmental
Agencies and
State PSC

Existing Regs
Administered by
State and
Federal Pipeline
Agencies
(USDOT/ State
PSC)

New UIC Regs
administerd under
federal partnership with
State Environmental or
Oil and Gas Agency



Carbon Dioxide: Commodity, Pollutant, or Hazardous Waste?

- **Commodity**

- Commercial value for use in EOR / EGR, already active

- **Pollutant**

- Recent U.S. Supreme Court ruling that EPA must make this determination
- Crude oil, coal, and natural gas, if mismanaged

- **Hazardous Waste**

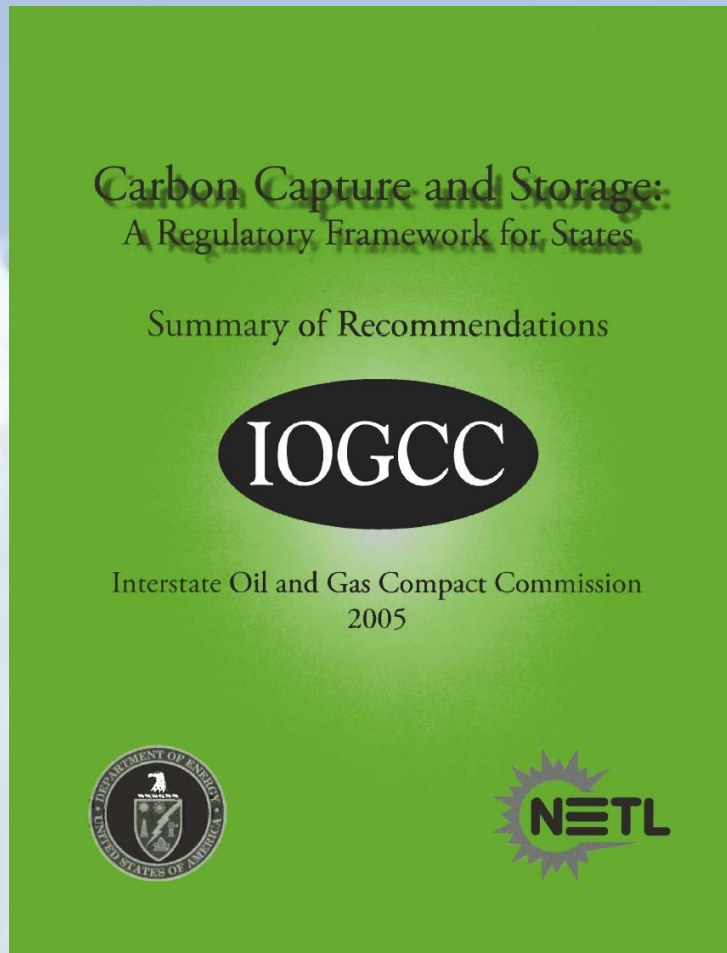
- Makes handling, injecting, and sequestering far more expensive
- Coupled with sequestration, encumbers EOR / EGR commercial opportunities in the U.S.



Task Force Representatives

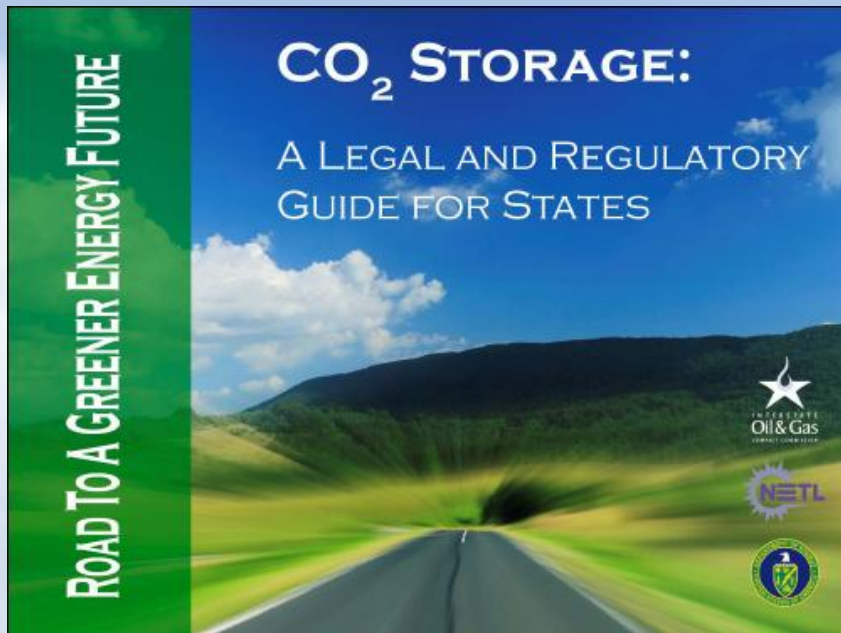
- Representing 15 States
- IOGCC member state and provincial oil and gas agencies
- DOE sponsored Regional Carbon Sequestration Partnerships
- Association of State Geologists
- US DOE
- Independent experts
- US EPA
- US BLM
- Environmental organizational observer

Brief Summary of Phase I Work and Recommendations



- Industry and states have 30 years experience in the production, transport and injection of CO₂.
- States have necessary regulatory analogues in place to facilitate development of a comprehensive CCGS regulatory framework.
- CO₂ should be regulated as a commodity to allow the application of oil and gas conservation laws which will facilitate development of storage projects.
- Involve all stakeholders including general public in the development of regulatory frameworks.

New IOGCC Phase II Report



- Released in January 2008
- Summary of the report and a copy of the full report on CD-ROM.

What the Guidance Document provides to states & provinces

**Storage of Carbon Dioxide in Geologic Structures
A Legal and Regulatory Guide for States and Provinces**

Topical Report

**Reporting Period Start Date: April 14, 2006
Reporting Period End Date: August 20, 2007**

**Prepared by the IOGCC Task Force on
Carbon Capture and Geologic Storage.
Principal authors: Lawrence E. Bengal,
Berry H. Tew, Jr., Michael D. Stettner and
Kevin J. Bliss**

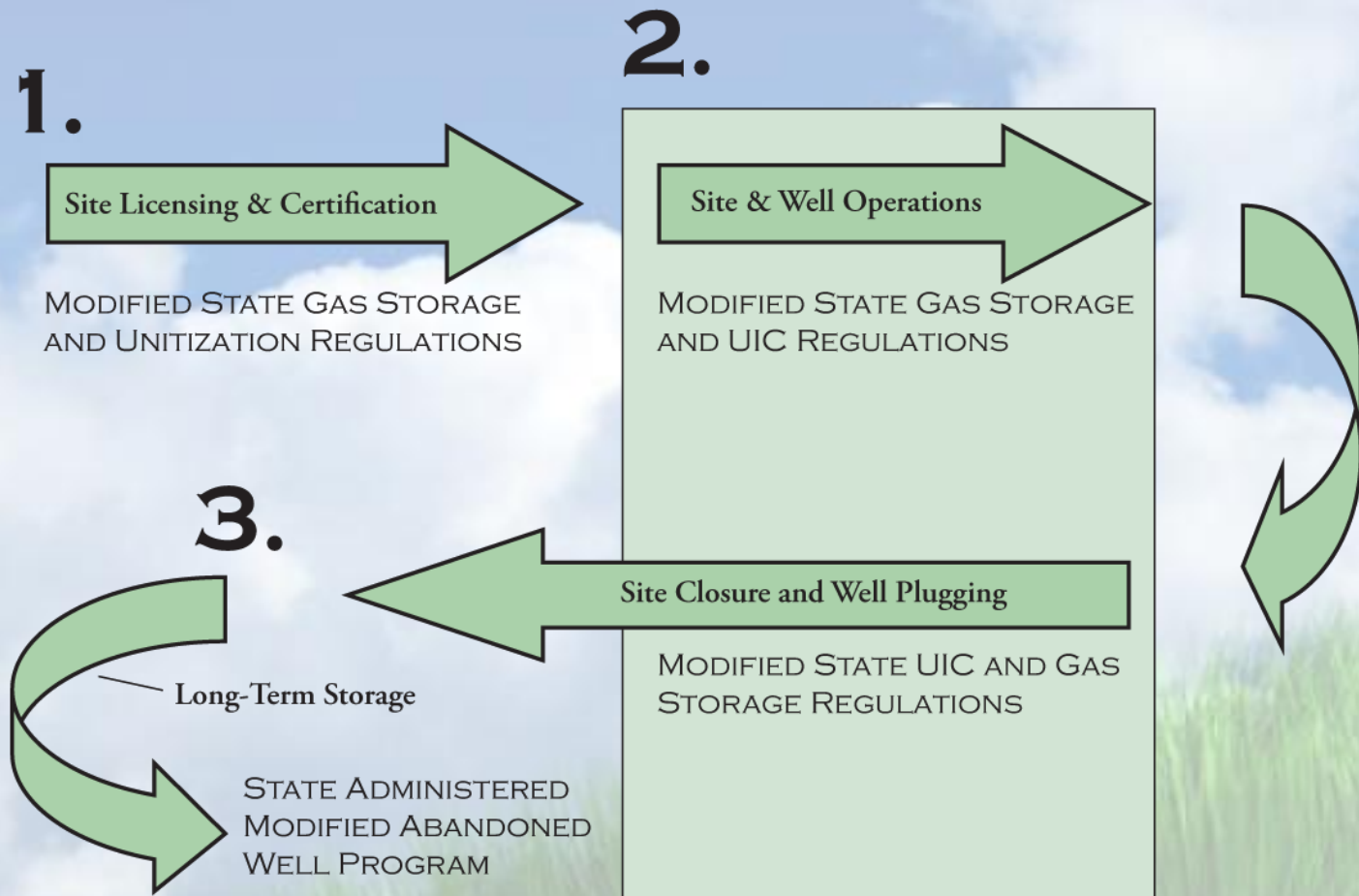
Report Issued: September 20, 2007

DOE Award No. DE-FC26-05NT42591

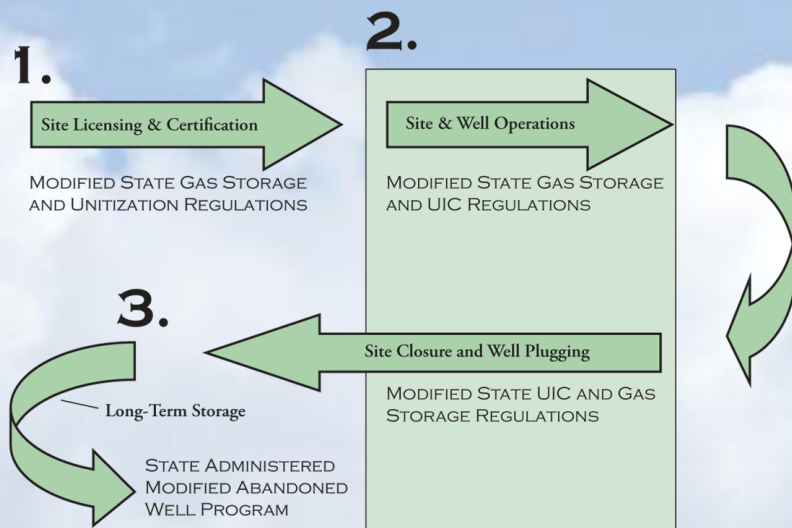
**Interstate Oil and Gas Compact Commission
P.O. Box 53127
Oklahoma City, OK 73105**

- Background on why states and provinces are the most logical “cradle to grave” regulators.
- Useful background on climate change and the importance of geologic storage.
- Model statute and regulations
- Legal analysis of ownership issues

CGS Regulatory Framework

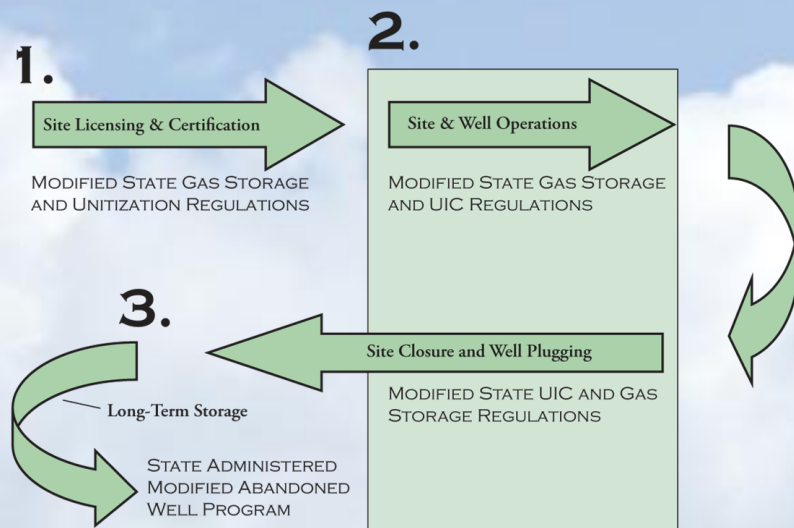


Phase I: Site Licensing including amalgamation of storage rights



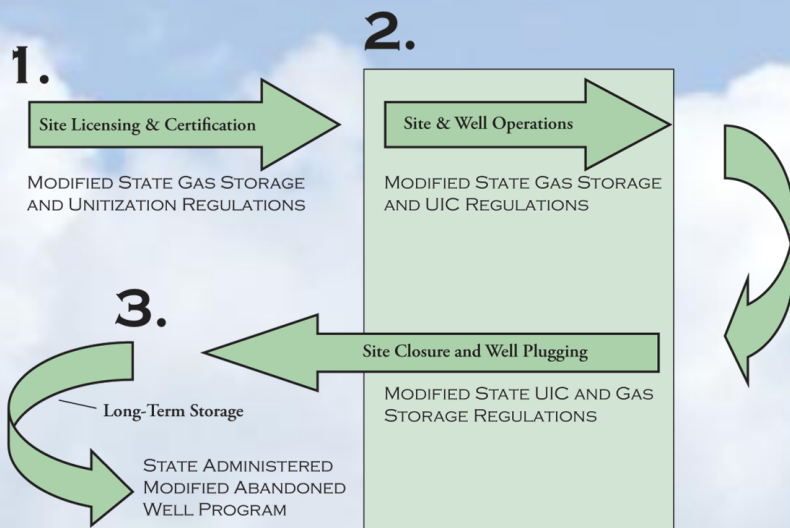
- **State jurisdiction** - Licensing of entire reservoir (resource protection) and amalgamation of rights (purchase/ lease/unitize/ eminent domain) and site/facility bond requirement.
- **State/Federal Partnership** – Permitting use of reservoir under EPA UIC State Primacy Authority. Storage site characterization, submission of detailed engineering and geological data, well operations and well bond requirement.

Phase II: The Storage and Closure Phase



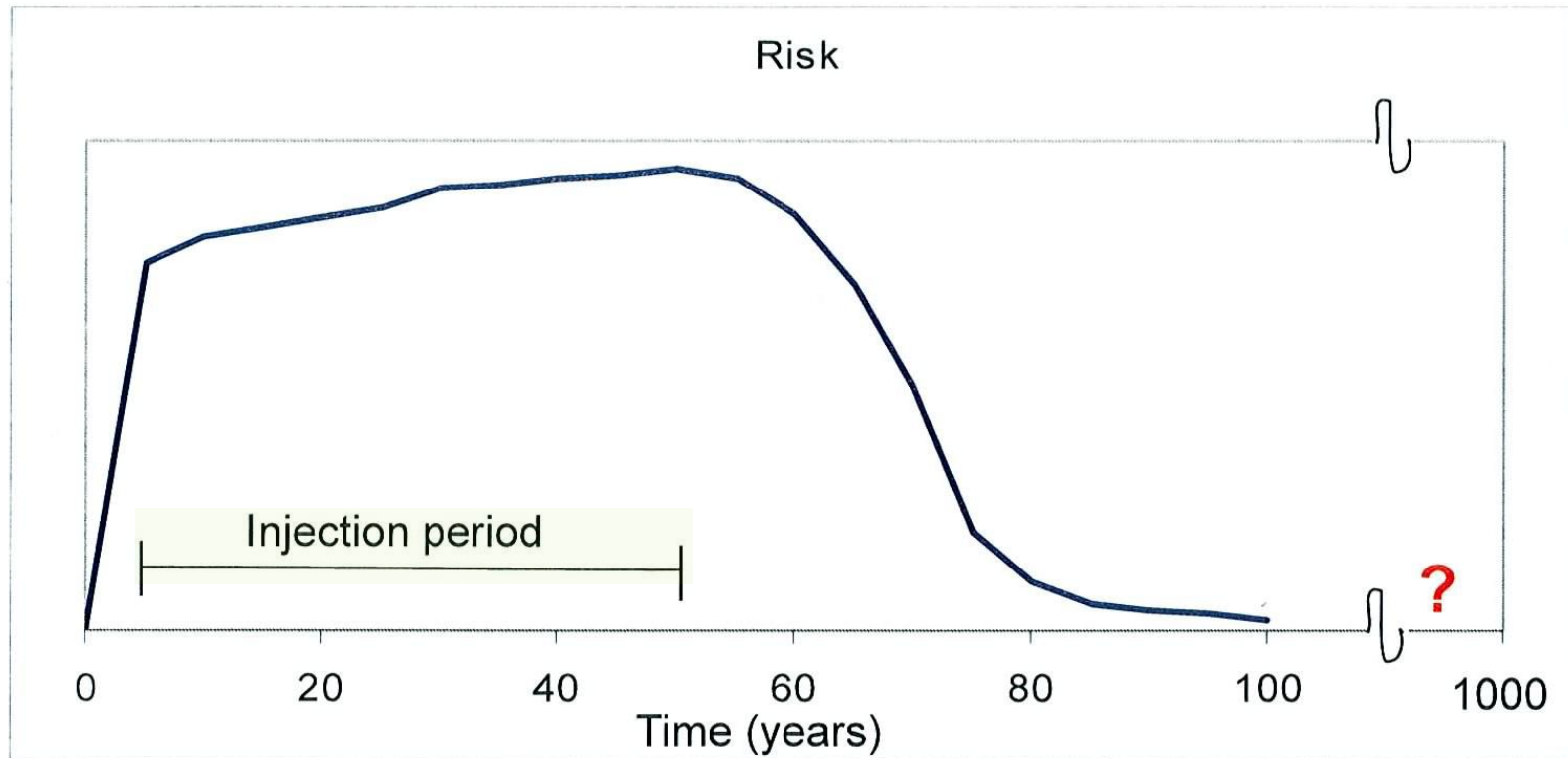
- The phase where the project is developed, operated and closed
- Regulation to safeguard life, health, property and the environment
- EPA regulatory overlap in this phase under Safe Drinking Water Act (UIC)

Phase III: Long Term “Care Taker” Phase (“this is public’s part of solution”)



- When the operator is no longer the responsible party and the long term care taker role is assumed by government
- Costs in this phase covered by state-administered trust fund.
- Funded by injection fee assessed to operator on per ton basis of CO₂ injected over life of project.

The risk timeline for leakage is heavily-laden in early times.



Why does it look like this?

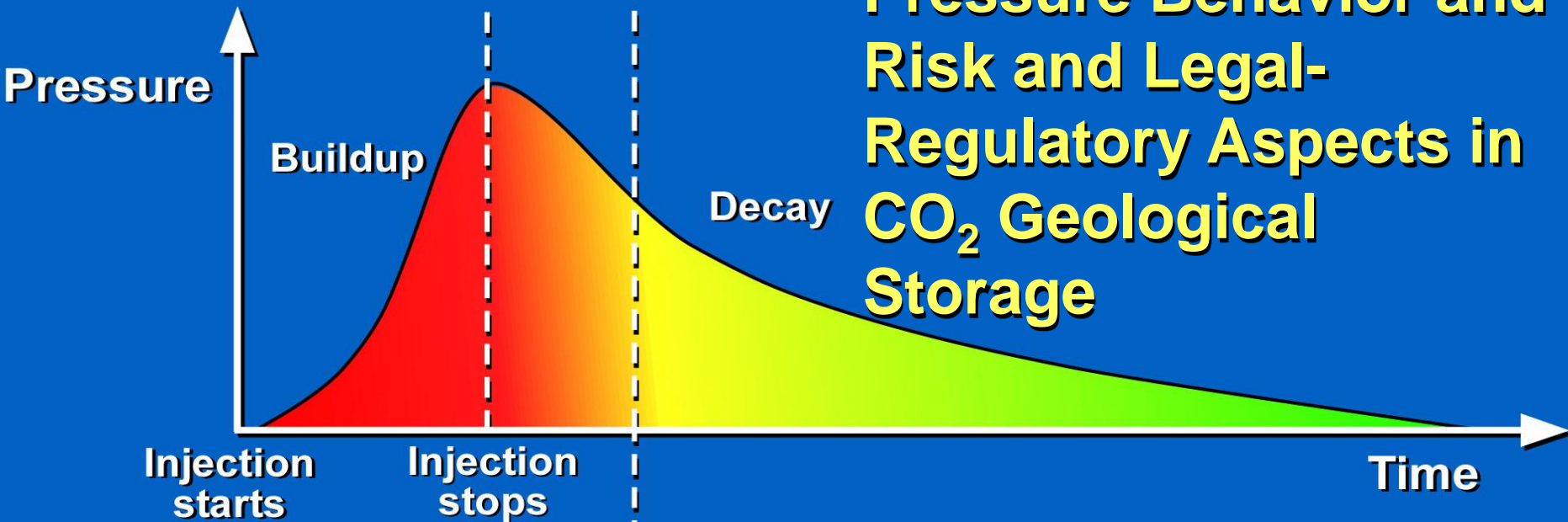
Pressure driver during and post injection

Most “changes” occur in early phase

Long-term effects trap larger quantities of CO₂

Seals may be affected over long-term

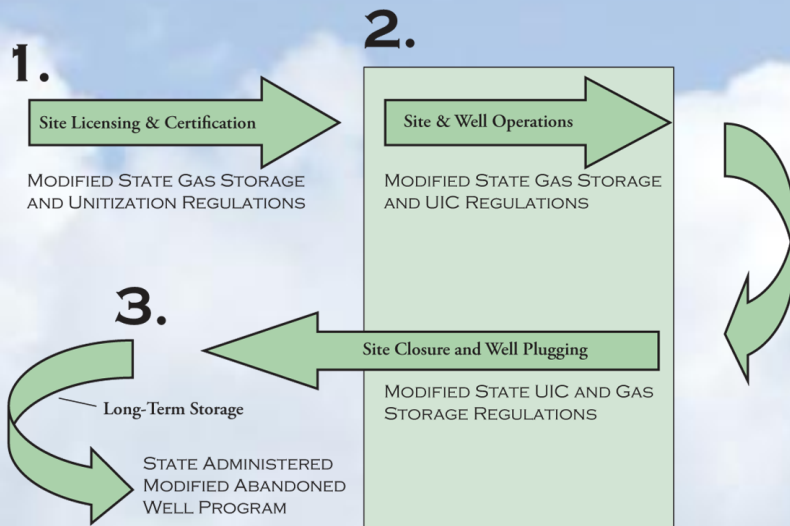
Relation between Pressure Behavior and Risk and Legal-Regulatory Aspects in CO₂ Geological Storage



Operational Period	Active	Closure	Post-Closure
Trapping Mechanism Dominance	Primary	Increasingly Secondary	
Risk	Increasing	Decreasing	
Monitoring Frequency & Resolution	High	Targeted	Decreasing
Liability	Operator and/or Emitter		State Agency

EPA Regulatory Overlap

- EPA authority under SDWA in green box



- Will ensure national consistency and protection of drinking water for operational phase

- State and EPA regulatory frameworks systems can work “seamlessly”.

PROJECTED USEPA RULE DEVELOPMENT TIMELINE

- **JULY 2008** - PROPOSED RULE PUBLISHED - FOLLOWED BY 90 – 120 DAY PUBLIC COMMENT PERIOD
- **2009 (date uncertain)** – PUBLISH NOTICE OF DATA AVAILABILITY (NODA) – FOLLOWED BY 60 – 90 DAY PUBLIC COMMENT PERIOD
- **2010 (late) or 2011 (early)** – FINAL RULE PUBLISHED

ISSUES USEPA PROPOSED RULE WILL NOT ADDRESS

Due To Limitations in Federal Safe Drinking Water Act

- CO2 will not be classified as waste or pollutant
- Overall Site Licensing, Property Right Issues, Eminent Domain - (AOR/Permit Area modified to extend over entire area projected to be impacted by total volume of CO2 to be stored)
- Long Term “Caretaker” Responsibility (Post Closure Liability) for the time period beyond the established regulatory post closure period - (Rule proposes 50 years). Industry or state role at present time if projects undertaken.

USEPA GS Regulations Overview

- GS wells proposed to be a new class (Class VI), states will apply for primacy
- Establish site characterization requirements, extends AOR to entire reservoir area, including a surrounding area of pressure influence.
- Well operational, bonding and closure requirements
- CO2 EOR will remain Class II under UIC
- Regulations will allow for conversion from Class II to storage classification – define when storage begins and EOR ends
- Regulations will not determine if CO2 EOR will qualify for CO2 credit – future federal or market based system
- At present a state with UIC primacy could permit GS wells under UIC using existing or combination of UIC well classes.

Major Barriers to Deployment

- **Policy Development**
 - Waste vs. Commodity
 - Policy Support (acceptable approach)
- **Public Acceptance**
 - Education/positive outreach
- **Economic and Financial**
 - Who will pay (rate payers, share holders, gov't incentives)
- **Legal and Regulatory**
 - Long term care taker/liability determination
- **Scientific and Technical**
 - Large scale demo for necessary experience
- **Capacity**
 - Realistic available site assessments

States and Provinces Currently Developing Regulatory Systems Using IOGCC Model Legislation and Regulations

California

Indiana

Michigan

Montana

New Mexico

New York

North Dakota

Oklahoma

Texas

Alberta

British Columbia

Nova Scotia

Saskatchewan

States Which Have Enacted CO2 Storage Legislation

- **Illinois**
- **Kansas**
- **Ohio**
- **Utah**
- **Washington** (also has draft rules out for public comment)
- **West Virginia**
- **Wyoming**

IOGCC Task Force – Next Steps

- **The Guidance Document will continue to be perfected based on experience of the states and provinces.**
- **DOE and other funding sources sought to continue work of the Task Force.**
- **Task Force is continuing public outreach efforts and assisting states with legislation and rule development.**

CONTACT INFORMATION

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